Amendments to the Specification:

Please amend the paragraph on page 1 beginning at line 27 as follows:

The size of internal impedance in batteries, in the case of large capacity batteries, is very small at 1 mΩ or less. Likewise, the voltage ~~(V_{dc})~~($V_{Is'}$) generated by internal impedance in battery cells is a small signal of a number of mV. The voltage is very small (one-some thousandths) compared with the cell post voltage of 1.0-15V, and it's mixed with much electromagnetic wave noise from the surrounding area. Therefore, there is a need to appropriately separate this signal from a battery cell ~~voltage (V_{dc})~~voltage (V_{DC}), remove the noise from the signal by means of an optimized design of the noise removal circuit like the disclosed band-pass filter aimed at amplifying the signal appropriately, and input accurate, high resolution impedance voltage signals into the A/D converter unit in the main processor unit (MPU).

Please amend the paragraph on page 2 beginning at line 35 as follows:

This invention is related to a circuit which provides a method to measure the ~~direct current (DC) voltage (V_{dc})~~ battery cell voltage (V_{DC}) and the internal impedance ~~voltage ($V_{Is'}$) of the~~ of a storage battery cell by transforming the signal voltage (V_{Is}) which contains the small alternating current (AC) impedance voltage signal generated by the internal resistance of the storage battery cell, which is inputted through 4-terminal network circuit, to a proper level and making the Microprocessor unit (CPU) compute it. Also, this invention especially maximizes the impedance between the storage battery cell and the measuring circuit by means of High Input Common Mode Voltage differential amplifier to give the effect of isolating the both circuits. This invention comprises a band-pass filter, A/D converter and CPU circuit in a way to accurately ~~measure~~ calculate the internal impedance by measuring the impedance voltage ($V_{Is'}$) by the internal

impedance of a storage battery cell and the direct current (DC) voltage (V_{dc}) of a storage battery cell as well.

Please amend the paragraph on page 3 beginning at line 11 as follows:

However, as illustrated in FIG. 2, conventionally, voltage divider circuit Resistance R1 and R2 in the differential amplifier (1A) input terminal were used to measure the cell voltage of 1.0.about.15V, wherein the storage battery cell post voltage (V_{Is}) was divided by about half, reduced to 0.5.about.7.5V level, and inputted to the above differential amplifier (1A). Sequentially, the output signal of the above differential amplifier (1A) passes through the Buffer circuit, is converted into a digital value in the A/D converter, and inputted into the CPU to compute the ~~direct current (DC) voltage (V_{dc}) of the cell~~battery cell voltage (V_{DC}). Also as the impedance voltage ($V_{Is'}$) generated by the internal resistance of a storage battery cell is a very small signal, the circuit in the following way is used to measure it. The voltage signal (V_{Is}) of the storage battery cell is not divided to be measured. The direct current components in the above voltage signal (V_{Is}) are directly coupled through the direct current coupling circuit comprised of Resistance Rs and Rd and Capacitor Cs to obtain only impedance voltage signal ($V_{Is'}$) and this signal is inputted into another separate differential amplifier (1B) to have its noise removed by means of a band-pass filter circuit and a buffer circuit, and then this signal is inputted into the A/D converter inside the micro controller (MCU).

Please amend the paragraph on page 4 beginning at line 13 as follows:

This invention solves these problems. To solve these problems, this invention does not use the voltage divider circuit and the direct current coupling circuit~~, as used in a conventional method,~~ in the input ~~terminal~~ circuits of the differential amplifier (1) to apply the battery voltage signal (V_{Is}) of the storage battery cell which includes impedance voltage ($V_{Is'}$) to the input terminal circuit of the micro-controller (MCU), but connects the cell voltage (V_{Is}) of 0 ~ 16V which includes impedance voltage ($V_{Is'}$) directly to the input terminal of the above differential amplifier (1), and properly divides the direct current voltage (V_{dc}) of the battery cell and the impedance voltage signal and provides an optimized band-pass filter to remove the noise. In addition, this invention uses a proper A/D converter circuit and its peripheral circuits to produce desired resolution. This simple and concise method ensures more accuracy in measurement.

Please add the following new paragraph after the paragraph ending on line 34 of page 4:

In particular, if a high input common mode voltage differential amplifier is used, it has an effect that the input and output circuits are insulated from each other since the high resistors about hundreds of kΩ are connected to non-inverting and inverting input circuits of the differential amplifier. Further, another embodiment teaches a scheme to realize the function of amplifier by adopting an A/D converter built in a micro controller unit (MCU).

Please amend the paragraph on page 4 beginning at line 35 as follows:

Also this invention makes it possible not only to accurately measure the storage battery cell voltage ~~(V_{dc})~~(V_{DC}) and impedance voltage ($V_{Is'}$) by using one high input common mode voltage differential amplifier without being affected from the measuring circuit but also to couple the impedance voltage added to the direct current components of the battery cell voltage by means of a condenser and thus to produce precise and high resolution signals by A/D converter fitting to the purpose. This can effectively exclude the effect of the noise signal in the computation by means of properly designed band-pass filter (BNP) and thus it is possible to get the true value of the impedance voltage (V_{Is}). As another example of embodiment, this invention presents a proper method to use the A/D converter built in the micro-controller unit (MCU) in order to realize the function.

Please add the following new paragraph after the paragraph ending on line 9 of page 5:

Further, only the true value of impedance voltage can be effectively obtained by excluding the effect raised by ripple noise signals during measuring computation process from the internal impedance voltage signals by properly designed band-pass filter (BNP).

Please amend the paragraph on page 5 beginning at line 12 as follows:

Through the below FIG. 3, FIG. 4 and FIG. 5, the process of operation is illustrated in detail. FIG. 3 and FIG. 4 show that the direct current voltage ~~(V_{dc})~~(V_{DC}) of the storage battery cell and the impedance voltage signal ($V_{Is'}$) by the internal resistance of the storage battery cell is not voltage-divided and directly connected to the input terminal of the above differential amplifier (1). And they illustrate in detail the circuit for the input of a certain negative (-) constant voltage in the offset terminal of the above differential amplifier (1) so as to obtain the output signal accurately related to the input signal.

Please amend the paragraph on page 6 beginning at line 19 as follows:

The above differential amplifier (1) is a differential Operational amplifier (for instance, CMOS type or FET type) whose impedance is very high (input bias electric current is nA and less) in comparison with ordinary differential Operational amplifier. Even if hundreds of KΩ resistance is connected to the non-inverting input and inverting input of the above differential amplifier, it can work accurately.

As shown in FIGs. 4 and 5, the high resistors about hundreds of KΩ are respectively connected to the non-inverting and inverting input terminals of the differential amplifier (1) so as to be applied the high common-mode voltage such as the post voltage of battery system or battery cells.

As it is designed so that the amplification gain for the differential input voltage signal can be 1, the output of the above differential amplifier (1) is the sum of the differential voltage signal (V_+-V_-) which is the storage battery cell post voltage and the reference voltage (Vref) which is inputted into the offset terminal, and is shown as (V_+-V_-) +Vref. Therefore, when the 0V~16V voltage signal of a battery cell post voltage (V_{Is}) is inputted, as the offset reference voltage (Vref) is set at -8V, the output of the above differential amplifier (1) can get values of -8V~+8V within the range of the saturation voltage of less than ±10V. Also, if the negative (-) reference voltage (Vref) which is inputted into the offset terminal be -11V, it is possible to input even the higher voltage within 1~21V into the above differential amplifier (1) by the above computing formula and also to get the output signal within -10V~+10V.

Please amend the paragraph on page 6 beginning at line 35 as follows:

In the output voltage signal which is level-shifted to the size within -8V ~ +8V through the above differential amplifier (1), the impedance voltage ($V_{Is'}$) with a number of mV peak value on the direct current voltage (V_{DC}) components and the noise coming from outside are mixed. The ripple noise in the above output voltage signal (V_{Is}) is removed through the direct current filter circuit (3) comprised of Resistance R1 and Capacitor C1. And then the pure direct current voltage ~~(V_{DC})~~(V_{dc}) signal comes out and is buffered (buffering - prevents the loading effect by the input--output impedance) in Buffer Circuit (4), and thus the buffered signal is connected to the input terminal of 12 Bits A/D converter (5) to raise the resolution degree for measurement. That is, because the allowable output range of the direct current voltage signal of the Buffer Circuit (4) is within -10V~+10V, it is possible to increase the resolution degree only by adopting a micro-controller unit (MCU) with a A/D converter which is able to convert the signal up to the above range of voltage or equivalent one.